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ABSTRACT

The purpose of this study was to test training techniques designed (1) to induce conservation of discontinuous quantity in children, and (2) to induce ability to take different social roles. Also tested was this hypothesis: successfully training children in ccnservation will improve their ability to take different social roles, and conversely, successfully training children to take different social roles will induce conservation in them. A heterogeneous sample population of 103 children (aged 45 to 64 months) was given a battery of tests to measure grasp of correspondence, conservation, physical perspective, and social role play. Children were placed in 8 heterogeneous groups. Each of seven of these groups was given a 6-week training program involving a different combination of three basic conditions: reversibility-reciprocity, physical perspective-taking, and social role-play. The eighth group (control) was given no training. Subjects were posttested on the pretest battery. Results indicate that reversibility-reciprocity training does induce conservation of discontinuous quantities in children, and that improvement in children's social role-taking ability is more closely associated with reversibility-reciprocity training than with other kinds of training. [Not available in hard copy due to marginal legibility of original document.] (Author/WY)

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A PILOT INVESTIGATION OF THE EFFECTS OF TRAINING TECHNIQUES DESIGNED TO ACCELERATE CHILDRENS' ACQUISITION OF CONSERVATION OF DISCONTINUOUS QUANTITY

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TABLE OF CONTENTS

	Page
Introduction	
Problem	2
Review of Literature	2,3
Objectives	3
Methodology	
Subjects	3,7
Procedure	7-9
Results	
Effects of Training	9,11
Subsidiary Findings	14,17
Future Studies	17,18
Conclusions	18
Summary	
References	19-21
Appendix I	22-29
Appendix II	30-37

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LIST OF TABLES

Section	Table		Page
Review of Literature	1	Summary of Recent Conservation Training Studies	4,5
Subjects	2	Within and Between Training Groups Differentiation	6
Effects of Training	3	Subjects' Improvement in Conservation Ability	10
Effects of Training	4	Subjects' Improvement in Role-Taking and Perspective-Taking Ability	12
Subsidiary Findings	5	Correlations Between I.Q., Socio-Economic Status (SEC), and Test Scores at Pre-Training Testing	13
Subsidiary Findings	6	Pre and Post-Training Test Correlations	15
Subsidiary Findings	7	Correlation Among Conservation Test Scores	16

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SUMMARY

The purposes of this study are (1) to test trainings designed to induce conservation of discontinuous quantity in children, (2) to test trainings designed to induce in children the ability to take different social roles, (3) to test the hypothesis: successfully training children in conservation will improve their ability to take different social roles, and conversely, successfully training children to take different social roles will induce in them conservation.

Each subject in a heterogeneous sample population of 103 was given a battery of tests for the purpose of measuring his grasp of correspondence, conservation, physical perspective, and social role-taking ability. Then the population was divided into eight heterogeneous groups. Each of seven of these groups was given a six week, small group training in a different combination of three basic conditions: reversibility-reciprocity, physical perspective-taking, and social role-play. The other group, the control, was given no training. Finally each subject was again given the battery of tests that had been given before training.

It was found that reversibility-reciprocity training does induce conservation of discontinuous quantities in children, and that improvement in childrens' social role-taking ability is more closely associated with reversibility-reciprocity training than with other trainings.

PROBLEM

Conservation as defined by Piaget (1952) is the ability to recognize that some properties of an object or a group of objects such as quantity, number, length, and weight remain invariant in the face of certain transformations such as changing the shape of an object, dividing it into pieces, or changing the arrangement of a group of objects, and dividing the group into smaller groups. It has been shown that the presence of one type of conservation, conservation of discontinuous quantity or the conservation associated with groups of similar objects, is a prerequisite for understanding concepts of number. This study proposes to test the efficacy of a series of learning experiences designed to help young children acquire conservation, specifically the conservation of discontinuous quantity.

Piaget contends that acquisition of the conservation of discontinuous quantity occurs in three definite stages. In the absence of conservation, stage one, a subject estimates the quantity of an aggregate on the basis of factors which are irrelevant to the number of items in the aggregate. A subject may say that a long row of four blocks contains "more" blocks than a shorter row of four blocks. According to Piaget, a child in the first stage is egocentric, seeing the situation from a single point of view without knowledge of other perspectives. During stage two a subject sometimes shows conservation or the related principles, identity, reversibility, and compensated relationship, in analyzing a transformation but frequently reverts back to egocentric analysis. After acquiring conservation, stage three, the subject analyzing a transformation consistently exhibits conservation where the concept applies.

Feffer and Gourevitch (1960) have shown that there is a strong positive relationship between a child's ability to analyze physical perspective and his ability to assume different social perspectives. One might hypothesize that successfully training a child to utilize conservation will also improve his ability to assume different social roles, and conversely, that successfully training a child to assume a variety of social roles will improve his ability to exhibit conservation in analyzing physical transformations.

REVIEW OF THE LITERATURE

Comprehensive reviews of the research on the conservation of discontinuous quantity in children may be found in several sources: Flavell (1963), Sigel (in press), and Watson (in press). We will not do a complete review of the literature but, rather, concern ourselves with only those studies directly related to previous attempts to induce conservation in children.

As Shantz and Sigel (1967) indicate, three types of instruction have shown some success in inducing conservation: linquistic facilitation, logical operations training employing a conservation task as part of the training procedure, and logical operations training which does not employ a conservation task in the training. Table 1 (from

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Shantz and Sigel (1967) summarizes the experiemnts employing the training of logical operations.

In addition to the studies reported in Table 1, Shantz and Sigel (1967) themselves attempted to induce conservation by training to facilitate logical operations in children. They conclude: "that conservation of quantity and number, and to a lesser extent, conservation of area, can be induced in kindergarten children by two types of training procedures: labeling classification and discrimination-memory training. In contrast to other training studies in the literature, the methods used in this study were focused upon general psychological processes. Possible explanations were offered for the similarity in outcome of the two methods, in terms of providing training in different processes which might lead to conservations, and similar processes which the two training methods shared that might induce conservations."

OBJECTIVES

This study proposes:

(1) To test a series of experiences designed to facilitate the acquisition of conservation of discontinuous quantities by children ages 45 - 64 months.

(2) To test a series of experiences designed to facilitate childrens' acquisition of the ability to take different social roles.

(3) To test the hypothesis: that successfully training a child to show conservation will improve his ability to take different social roles, and conversely, that successfully training a child to take different social perspectives will improve his ability to conserve.

SUBJECTS

The original sample population of 168 pre-school children enrolled in seven day-care and kindergarten centers in Dayton, Ohio. From this population some data was available for 146 subjects, but, as a result of moving, illness, and withdrawal, the final study sample consisted of 103 children from whom both pre and post-training data was compiled. At the time of pre-training testing the children ranged in age from 45 to 64 months, averaging 53 2/3 months.

The sample population was divided into eight groups: seven training groups and one control. With respect to age there was little difference among the groups; only a 4 1/4 month spread between the two extreme means. Each group included a section of children from two different schools so that there was generally a contrast in socio-economic status and Peabody I.Q. present within each group. Table 2 shows the composition of the training groups with respect to age, socio-economic status, previous nursery school attendence, I.Q., and type of training given.

Table 1

Summary of Recent Conservation Training Studies

Author(s)	Sample	Type of Conservation	Types of Training	Number of Groups	Training Sessions	Results
Wallach & Sprott, 1964	N=30 Mean CA= 6, 11	Number *	Reversibility vs. Control	N=1 C N=1 E	N=1 (included pre- & posttests & training) Individual training	All Es conserved number in at least 1 of 2 test items; no Cs did. Delayed posttest: 13 of 15 Es conserved in 3 tests; 1 of 15 Cs conserved.
Beilin, 1965	N=170 Median CA=5, 4; CA range= 6,5 to 7,8	Number & Length (Area generalization task)***	Nonverbal reinforcement Verbal reinf. Verbal rule Equilibration	N=1 C N=4 E	N=4 (Each 40 minutes; individual training	Verbal Rule instruction was only E Group which performed significantly better than C group (**Criteria) No transfer-of-training to Area conservation task
Gruen, 1965	N=90 Mean CA= 5, 1; CA Range=4½ to 6,4	Number** (Length & Substance generalization tasks)	Verbal Pretrained vs. No pretrained groups divided into: Direct Training; Conflict Training; Control Group	N=2 C N=4 E	N=2 (16 training trials per session); 12 pre-training trials	46% of total Ss gave 1 or more number conservation Rs posttest Verbal pretraining + conflict training group significantly better than C group with no pre-training Verbal pre-training alone about as effective as direct or conflict training
Sonstroem, 1966	N=81 Median CA= 7 years	Quantity* (continuous)	Compensation (labeling) vs. Reversibility (no labeling) Screening vs. no screening Ss manipulate materials vs. no handling	N=0 C N=8 E	N=1 (included pre- & posttests, & training) Individual	Conserved: N=35; No conservation: N=46. Three variables as main effects did not induce conservation Compensation + manipulation combined elicited significantly more conservation than any other training combination groups.

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Table 1 (cont.)

Author(s)	Sample	Type of Conservation	Types of Training	Number of Groups	Training Sessions	Results
Sigel, Roeper & H ooper, 1966 (two studies combined)	N=13 CA Range= 4,2 to 5,0 Mean IQ= 147	Quantity** Weight Volume	Combined classification, seriation & reversibility vs. Control group	N=1 C N=1 E	N=9 (25 minutes each); Groups of 3 to 5 Ss	Of 10 Es, 9 conserved 1 or more types Of 8 Cs, 1 conserved 1 or more types
Sigel & Shantz, in preparation	N=30 Mean CA= 4, 10 CA range= 4,4 to 5,4	Quantity** Weight Area	Combined labeling & classification vs. Control group	N=1 E N=1 E	N=9 (25 minutes each); Groups of 5 Ss	Significant gains of Es vs. Cs in quantity and weight conservation; Of 15 Es, 5 conserved 1 or more types; of 15 Cs, none conserved any type.
Mermelstein, 1967	N =120 CA range= 5 to 6,2	Quantity** (continuous & discontinuous)	Cognitive Conflict Multiple classification Verbal Rule Language activation	N=2 C N=4 E	Mean N=7 (10 minutes each) Groups of 20 Ss (?)	No significant training effects for any E group compared to C groups No significant differences between E groups

*Conservation criterion: judgment of equality ("the same).
**Conservation criteria: judgment of equality and adequate justification.
***Both types of criteria used for various analyses.

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Table 2

WITHIN AND BETWEEN TRAINING GROUP DIFFERENTIATION

Training Group	Nursery School	N	Mean I.Q. (Pre-Training)	Socio-Economic Status I, II, III, ?				Previous Nursery School Yes	No	?	Mean Age (Pre-Training) In Months	Training Given
1		14	101									reversibility-reciprocity
	Parkside	7	91		2	5		3	2	2	54	
	Treasure House	7	112	1	5		1	1	6			
2		13	86									social role-play
	Melissa Bess	7	85		1	6		4	3		53	
	St. Margaret's	6	88	5			1	3	3			
3		11	89									physical perspective-taking
	Melissa Bess	6	81			6		5	1		$53\frac{1}{3}$	
	Treasure House	5	102	4	1			2	3			
4		16	91									reverse.-recip. + role-play
	Melissa Bess	8	81		2	6		6	1	1*	53	
	Wee Haven	8	102	8				4	4			
5		11	95									reverse.-recip. + perspective
	Parkside	7	90			6	1	3	3	1	52	
	Little Red School.	4	105	1	3			1	3			
6		15	102									role-play + perspective
	St. Margret's	7	98	2	4		1	3	4		$54\frac{1}{2}$	
	Kiddie Kastle	8	105	7	1			5	3			
7		15	102									all three
	Little Red School.	6	102	4		2			6		53	
	Kiddie Kastle	9	102	9				4	5			
8	Wee Haven	8	104	4	4			4	4		$56\frac{3}{4}$	control
Totals:	7 schools	103	mean 96	45	23	31	4	48	51	4		

* started in mid-year

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The socio-economic status classification was made on the basis of the father's occupation, or if the father was not living at home, the mother's occupation, according to United States Census Bureau standards. Level I includes professional and technical workers, managers, officials, proprietors, and farmers; Level II includes clerical workers, salesmen, craftsmen, and foremen; Level III includes operatives such as drivers, service workers, laborers, welfare recipients, and the unemployed.

As can be seen in Table 2, each of the centers participating in the study serves a fairly well defined socio-economic group. Parkside Children's Center is a day-care institution with children from working class and poor backgrounds, predominantly white; Treasure House and Wee Haven nursery schools serve middle and upper class white children; Melissa Bess is a day-care center with working class and poor negro children; St. Margeret's is a day-care nursery with middle class negro children; Little Red Schoolhouse serves middle and working class white children; Kiddie Kastle is a nursery school serving upper-middle and middle class children.

It was intended that each training group contain a population of both middle and working class children so that it could be determined whether the trainings have a differential effect on these differing populations. However, as is indicated in Table 2, training groups 6 and 7 did not contain enough working class children to test this hypothesis.

Table 2 also contains the mean Intelligence Quotients, measured by the Peabody Picture Vocabulary Test at pre-training testing, for the sections from each nursery school in each of the training groups. An analysis of variance indicates that there is no significant difference in I.Q. among the training groups.

About half of the subjects in each of the training groups attended nursery school in the year previous to this study. But the proportion of subjects in the sections from each nursery that attended nursery school previously varies.

PROCEDURE

Each subject was given a battery of tests for the purpose of measuring his grasp of one-to-one correspondence, conservation of discontinuous quantity, physical perspective-taking, and social role-taking. The subject population was then divided into seven training groups and one control group. Each of the seven training groups was given six weeks of group training in a different combination of three basis conditions: reversibility-reciprocity, physical perspective-taking, and social role-playing. Finally, each subject was again given the battery of tests he had taken before the training.

Pre-Training Testing:
First, each subject was given the Peabody Picture Vocabulary Test (Lloyd Dunn, American Guidance Service, Inc.) This test consists of 150 plates with four numbered pictures on each one. The

examiner reads the stimulus word, and the subject responds by indicating which of the four pictures best illustrates the word. The items are arranged in ascending order of difficulty. The final scores were converted into I.Q. scores with a mean of 100 and a standard deviation of 15. These scores provided a standardized, quick estimate of subjects' verbal intelligence.

Next, each subject was tested to determine the extent of his ability to compare magnitudes utilizing the distinctions: "bigger than - smaller than - same size as" and "more than - less than - same number as." The stimulus material consisted of five-by-seven cards bearing different numbers and sizes of either circles or isosceles triangles outlined in black. The area enclosed within these figures was the index of the "bigger than - smaller than - same size as" distinction; the number of figures on a card was the index of the "more than - less than - same number as" distinction. Both triangles and circles were used, instead of only one figure, to assure that the subject discriminated on the basis of area enclosed and number of figures rather than the peculiarities associated with any one particular figure. The comparisons were given in order of difficulty beginning with simple discriminations and ending with almost impossible ones.

Then each subject was given a group of tests: five tests of correspondence and conservation, two tests of counting and the ability to understand "same," the WISC field dependence test, and tests of perceptual discrimination, memory and repetition, role-taking, and physical perspective analysis. Appendix I gives a detailed sequential explanation of the various tests.

Stimulus materials for the correspondence and conservation tests consisted of red and black checkers, colored and lettered blocks, multicolored M & M candy, white 3 X 3 inch index cards, 1/2 inch diameter ram-colored wooden beads, and small clear drinking glasses. The WISC Picture Completion booklet was used for the field dependence test. Hand-drawn 6 to 8 inch high white pasteboard cutouts of "mother, father, sister or brother, and baby" figures were used in the role-taking test. A small doll and a rectanglar 3 X 3 inch wooden block with one side colored red and the opposite side colored blue were stimulus materials in the perspective-taking test. The individual tests are frequently interrelated and were given in ascending order of difficulty.

The tests were given to the subjects individually in their own nursery schools. Two testing sessions were required for each subject's testing.

Training:
After initial testing the subject population was divided into training groups. Each group consisted of two sections, each from a different nursery school. Training was conducted in the subject's own nursery school. The two sections of each training group were separately given the same type of training. Each training group was given training in a different combination of the conditions: reversibility-reciprocity, physical perspective-taking, social role-playing (See Table 2). The training consisted

of group activities conducted by assistants trained by the experimenter. Appendix II gives a detailed description of the activities and their use in training.

Training was given in one half-hour session per week for six weeks. Sessions were repeated for absentees, so all of the subjects completed training. Materials used in training are listed at the end of Appendix II.

Training was primarily directed toward improving subjects' performance on the tests of conservation with blocks (13), final correspondence-conservation (37), role-play and retelling (42, 43), conservation with beads and glasses (52), and physical perspective-taking (54). See Appendix I.

Post-Training Testing:
The subjects were retested within two or three weeks after the end of the training period (the precise time varied according to school). They were given the same tests that they had taken prior to training except that test questions 15 and 24 through 34 (tests of counting, correspondence, and memory -- see Appendix I) were omitted. These omitted questions were considered to be essentially only prompting within the test, and in the post-training testing only the more stringent criteria of improvement or change were desired. Also omitting these questions enabled testing of a subject in only one session.

INTER-RATER RELIABILITY

Two student assistants were trained to judge the proper catagories for subject response, and they coded the raw data independently. Then they went over their separate codings, resolved the discrepancies, and completed the coding. The independent codings showed substantial agreement on all the questions except those asking "why" and question 41 concerning use of pronouns (see Appendix I). These are the only questions for which ambiguous criteria create a lower degree of reliability.

EFFECTS OF TRAINING

The first objective of this study is to determine whether any of the training techniques described in Appendix II do, in fact, facilitate childrens' acquisition of conservation of discontinuous quantities. This poses the question: Did any of the training groups show significant improvement on the tests of conservation? Table 3 shows the results of Wilcoxon tests of significance of difference between the pre and post-training performance on some of these tests. Most of the training groups, including the control group, improved significantly on some of the conservation tests.

However, close analysis reveals that the reversibility-reciprocity training group improved on more of the conservation tests than did

Table 3

SUBJECTS' IMPROVEMENT IN CONSERVATION ABILITY

Wilcoxon tests of significance of difference between pre and post-training test scores on conservation tests by training group:

Training Group	Training Conditions	Conservation Tests 13	21	37	52
1	reversibility-reciprocity	n.s.	**	***	**
2	social role-play	n.s.	n.s.	*	**
3	physical perspective-taking	n.s.	*	***	n.s.
4	reverse.-recip. + role-play	n.s.	n.s.	***	***
5	reverse.-recip. + perspective	n.s.	n.s.	***	n.s.
6	role-play + perspective	n.s.	n.s.	n.s.	reverse
7	all three	n.s.	n.s.	n.s.	*
8	control	n.s.	***	*	n.s.
	(group combinations)				
1&4	reverse.-recip. & reverse.-recip. + role-play	n.s.	*	***	***
1&5	reverse.-recip. & reverse.-recip. + perspective	n.s.	***	***	***
4&5	reverse.-recip. + role-play & reverse.-recip. + perspective	reverse	n.s.	***	***
2&4	role-play & reverse.-recip. + role-play	n.s.	*	***	***
2&6	role-play & role-play + perspective	n.s.	n.s.	n.s.	n.s.
3&6	perspective & role-play + perspective	n.s.	n.s.	n.s.	***

* = significant to .05

** = significant to .02

*** = significant to .01

n.s. = not significant

reverse = significant regression of ability

any other group. Furthermore, combining the reversibility-reciprocity training group with other training groups in which reversibility-reciprocity training was given and comparing the improvement of these combinations of groups with the improvement of combinations of groups in which no reversibility-reciprocity training was given (Table 3), also supports the interpretation that the reversibility-reciprocity type of training did induce conservation more effectively than the other trainings. On the basis of this evidence we conclude that our reversibility-reciprocity training does facilitate childrens' acquisition of conservation of discontinuous quantities.

The second objective of the study is to determine whether any of our training techniques improve childrens' ability to take different social roles. Table 4 shows the result of Wilcoxon tests of significance of difference between the pre and post-training scores on the test of role-taking and retelling (Appendix 2, test 42-43) for the individual training groups and for different combinations of training groups.

The results are inconclusive and appear to be negative. The group given role-play and physical perspective training significantly regressed in role-taking ability. The control group improved significantly because just one of its eight subjects improved spectacularly. But the role-play training group did not improve significantly in role-taking ability.

Tests of significance of difference between pre and post scores on combinations of groups in which role-play training was given, confirm that the role-play type of training did not induce any significant improvement in role-taking ability. Combinations of groups which were given physical perspective-taking training also show no significant improvement in role-taking ability. However, tests of significance of difference on combinations of groups in which reversibility-reciprocity training was given consistently show improvement in social role-taking and physical perspective-taking ability.

We have not determined adequately in relation to a control that any of our trainings induce in children the ability to take different social roles. But we do conclude that improvement in childrens' role-taking ability is more closely associated with our reversibility-reciprocity type of training than with any of our other training techniques.

The third objective of the study is to determine whether there is a relationship between childrens' ability to conserve and their ability to take different social roles; specifically whether successful training in one increases facility in the other and vice versa. Neither pre nor post-training correlations of role-taking ability (test 42-43) with ability to conserve (tests 13, 21, 37, 52. See Table 5) are significant, nor do they show any significant pattern. And there is no significant correlation between social role-taking ability and physical perspective-taking ability (test 42-43 X test 54. Table 5) which might suggest that they are related.

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Table 4

SUBJECTS' IMPROVEMENT IN ROLE-TAKING AND PERSPECTIVE-TAKING ABILITY

Wilcoxon tests of significance of difference between pre and post-training test scores on a test of social role-taking and a test of physical perspective-taking by training groups:

Training Group	Training Conditions	Role-Taking Test 42-43	Perspective-Taking Test 54
1	reversibility-reciprocity	n.s.	***
2	social role-play	n.s.	n.s.
3	physical perspective-taking	n.s.	n.s.
4	reverse.-recip. + role-play	n.s.	n.s.
5	reverse.-recip. + perspective	n.s.	reverse***
6	role-play + perspective	reverse*	reverse***
7	all three	n.s.	reverse*
8	control	***	reverse***
	(group combinations)		
1&4	reverse.-recip. & reverse.-recip. + role-play	*	n.s.
1&5	reverse.-recip. & reverse.-recip. + perspective	*	***
4&5	reverse.-recip. + role-play & reverse.-recip. + perspective	**	n.s.
2&4	role-play & reverse.-recip. + role-play	*	n.s.
2&6	role-play & role-play + perspective	n.s.	n.s.
4&6	reverse.-recip + role-play & role-play + perspective	n.s.	n.s.
3&6	perspective & role-play + perspective	n.s.	n.s.

* = significant to .05

** = significant to .02

*** = significant to .01

n.s. = not significant

reverse = significant regression of ability

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Table 6

CORRELATIONS BETWEEN I.Q., SOCIO-ECONOMIC STATUS (SEC), AND TEST SCORES AT PRE-TRAINING TESTING

		(I.Q.) X (SEC) -.457*	With I.Q. Partialed Out:
(SEC) X (13)	-.224*	.048	(SEC) X (13) -.277*
(21)	.017	.070	.055
(37)	-.337*	.402*	-.188
(52)	-.187	.232*	-.094
(42-43)	.100	.100	.167
(54)	.302*	.403*	-.145
(23)	-.289*	.305*	-.177
(24)	-.421*	.199	-.379*
(25)	-.356*	.407*	-.209*
(75)	.141	.096	.218*

* = significant to .05

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SUBSIDIARY FINDINGS

Though not explicity included within the objectives of this study, a number of factors which are relevant to a discussion of childrens' thinking were revealed in the course of the study. Correlations of subjects' performance on tests of various abilities reveal relationships among the following factors: socio-economic status, Peabody I.Q., field dependence (WISC), physical perspective-taking, and conservation ability.

In pre-training testing socio-economic status was found to be highly related to Peabody I.Q. And many of the other test factors were found to be related to both socio-economic status and I.Q. In order to determine to which of these two mutually related factors the other test factors are related, it was necessary to correlate the many test factors with socio-economic status and partial out the effects of I.Q. Table 5 summarizes these interrelations.

Two of the conservation tests (final conservation which scores on the basis of verbalized reasons (37), and conservation of beads in different size glasses (52) are related to I.Q. Physical perspective-taking (54) and field independence (23) are also related to I.Q.

Successful performance on three conservation tests (conservation with unequal rows of 4 and 5 blocks 13, correspondence in which the subject makes a row of checkers identical with that of the experimenter 24, conservation with equal rows of checkers 25) is related to low socio-economic status. Whereas successful performance on the memory test (75) is related to low socio-economic status.

One of the conservation tests (conservation with unequal rows of 4 and 5 M & M candies 21) is not significantly related to any of the other tests.

And role-play and retelling ability (42-43) is only related to memory (75, the coeficient is .236). ←

Table 6 shows the pre and post-training correlations among ← various tests.

One might expect to find high correlations among the conservation tests. However, this is not the case. Correlations among the conservation tests during pre-training testing are with one exception very low. Subjects do not show consistent performance on the pre-training conservation tests. Table 7 shows in detail the correlations among conservation tests during pre and post-training testing. Subjects clearly show more consistent performance on the conservation tests during post-training testing.

It is interesting to note the effect of training on physical perspective-taking ability (measured by test 54. See Table 4).

TABLE 5

Pearson Product-Moment Correlations		
Variables	Pre-Treatment	Post-Treatment
6 x 37	-.337 *	-.337 *
6 x 42-43	.100	.174
6 x 52	-.187	-.261 *
6 x 54	-.302 *	-.027
6 x 13	-.224 *	-.200 *
6 x 21	.017	-.067
6 x 23	-.289 *	-.334 *
37 x 42-43	.049	.073
37 x 52	.378 *	.403 *
37 x 54	.244 *	.193
37 x 13	-.027	.258 *
37 x 21	-.010	.193
37 x 23	.262 *	.384 *
42-43 x 52	.162	.137
42-43 x 54	.081	-.065
42-43 x 13	.129	-.137
42-43 x 21	.025	.098
42-43 x 23	-.005	.072
52 x 54	.245 *	-.035
52 x 13	-.028	.289 *
52 x 21	.024	.110
52 x 23	-.015	.313 *
54 x 13	.091	.019
54 x 21	-.030	-.106
54 x 23	.024	.089
13 x 21	.059	.172
13 x 23	.123	-.029
21 x 23	-.039	.000

* $p < .05$

The numbers listed under variables are column numbers (which can be found in the Appendices) referring to:

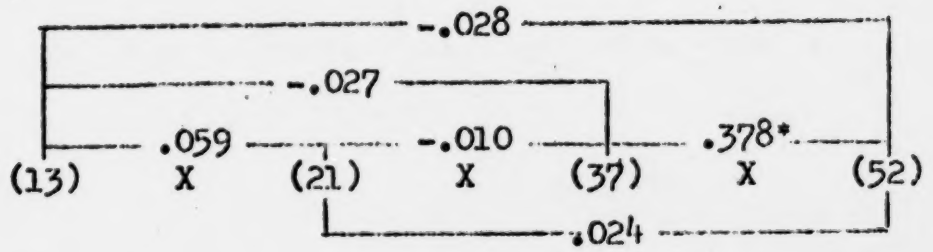
6 = socio-economic class
13 = conservation with blocks
21 = conservation with M&M's ←
23 = field dependence WISC
37 = final conservation
42-43 = role-playing & re-telling
52 = conservation with beads
54 = perspective

put table in correct order.
(6, 13, 21, etc

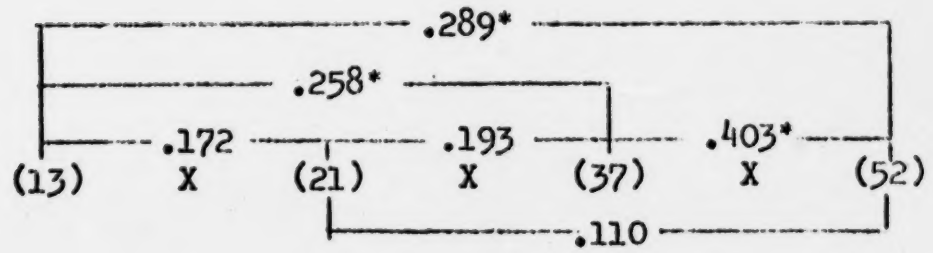
Table 7

CORRELATIONS AMONG CONSERVATION TEST SCORES

At Pre-Training Testing:



At Post-Training Testing:



* = significant to .05

While most groups show no significant change on this test some others, including the control group, show a significant regression. But again, subjects' significant improvement in perspective-taking ability is more closely associated with the reversibility-reciprocity training than with any other.

FUTURE STUDIES

It is clear that in our culture the acquisition of conservation is a natural developmental process. Training studies attempt to show that certain types of experience accelerate and are prerequisite to this process. Several findings of this study raise implications which bear directly upon the question of reliability in conservation training studies.

At the second testing the control group shows a significant improvement in performance on two conservation tests (21, 37) and the role-play and retelling test (42-43. See Tables 3 and 4). This improvement can only be due to one or both of the following factors: 1) subjects' progress in the natural conservation acquisition process, 2) acceleration of subjects progress in acquiring conservation as a result of the first testing which may then be described as a training experience. Within the methodology of this study it is impossible to determine the extent to which each of these factors contributes to control group improvement. And so it is impossible to determine the extent to which each of these factors contributed to the improvement the training groups showed at post-training testing.

Because of our ignorance of the differential effects of all the varied tasks which are used to test for conservation each conservation training study needs a methodology which includes controls adequate to determine the extent of possible training effects of the tests as well as the training effects of the avowed "training."

Future conservation training studies might, therefore, utilize a test-test-training-test design rather than the usual test-training-test design . This would be especially important in studying a group of subjects in the transition stage of conservation acquisition.

Another aspect of this study bears further investigation. It is probable that there are differential effects of training subjects of different socio-economic status. Wilcoxon tests of significance of change were run separately on the middle class and the working class subjects within each treatment group for some of the tests. In many cases there was an insufficient N for analysis, however, in some groups differential effects were discovered. For instance, on test 52 (conservation with beads in glasses) in the social role-play training group the middle class subjects improved significantly whereas the working class subjects did not. On the other hand, on ← the same test the working class subjects in the perspective-

taking training group improved significantly whereas the middle class subjects did not. Future studies should be designed to determine the differential effects of identical training on subjects of different socio-economic status.

The design of this study makes it impossible to ascertain the effects of multiple-condition training as compared to single-condition training, because the subjects in the multiple-condition training groups were given only half as much training in each condition as the subjects in the single-condition training groups. Future studies should be designed so that subjects in multiple-condition training groups are given as much training in each condition as the subjects in single-condition training groups.

Furthermore, comparison should be made of subjects who show improvement after training regardless of the type of training they are given, with subjects who show no improvement after training. It may be that there are common characteristics of subjects who are amenable to training in conservation.

CONCLUSIONS

It is concluded that reversibility-reciprocity training does facilitate childrens' acquisition of conservation of discontinuous quantity, and that improvement in childrens' social role-taking ability is associated with reversibility-reciprocity training. It is concluded that neither perspective-taking training nor role-taking training are associated with improvement in childrens' social role-taking ability, physical perspective-taking ability, or conservation ability.

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APPENDIX I

TESTING PROCEDURES: Test Descriptions and Response Categories

Test
Number

13 TEST OF CONSERVATION WITH BLOCKS [1]

The experimenter lays out a row of five blocks and then a row of four blocks next to it, spread out such that the row of four blocks is longer than the row of five. The subject is asked, "Which is more?"

1. S responded that the row of five is more.
2. S responded that the row of four is more.
3. No clear data available

14 WHY?

The question "Why?" is asked after all tests of conservation and correspondence in an attempt to distinguish a more refined developmental sequence in the acquisition of conservation. It distinguishes children who make conservation responses and are unable to verbalize the logical operations involved from children who are able to. The following response categories are used in all "Why?" questions.

1. S was unable to give any coherent response.
2. S made a response which was not clearly related to the question. This includes irrational and egocentric responses.
3. S made a response based on the array of stimuli but without attending to the logical operations involved.
4. S made a response based on counting the individual elements in the two sets of the comparison.
5. S's response was based upon logical operations.
6. No clear data available.

15 TEST OF COUNTING

This test is given to subjects who give response 2 on test 13. The subject is prompted to count the blocks in each row.

1. S was unable to recite the numbers from 1 to 5.
2. S was able to recite the numbers but did not point to the appropriate block while counting.
3. S was able to count and point to the appropriate block but was confused as to the final number of blocks in each row.
4. S was able to say how many blocks were in each row.
5. No clear data available.

16 WHICH IS LONGER?

The subject is asked which row is longer.

1. S responded that the row of four blocks is longer.
2. S responded that the row of five blocks is longer.
3. No clear data available.

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17 WHY?
Same as test 14

18 WHICH ARE THE SAME?
The experimenter lays out three rows of evenly spaced blocks: a row of two blocks and two rows of three blocks. The subject is asked, "Which are the same?"

1. S responded that the two rows of three blocks are the same.
2. S responded that the row of two blocks and a row of three blocks are the same.
3. No clear data available.

19 WHY?
Same as test 14

20 CHECKERS FOR BLOCKS
This test is given to subjects who give response 1 on test 18. The experimenter removes one row of three blocks and replaces it with a similar row of three checkers. The subject is again asked, "Which are the same?"

1. S responded that the row of three blocks and the row of three checkers are the same.
2. S responded that the row of three blocks and the row of two blocks are the same.
3. No clear data available.
4. Test not given.

21 CONSERVATION WITH M & Ms[2] (Similar to test 13)
The experimenter lays out a row of five M & Ms and then a row of four M & Ms next to it, spread out such that the row of four M & Ms is longer than the row of five. The subject is asked to choose either row.

1. S chose the row of five M & Ms.
2. S chose the row of four M & Ms.
3. S refused to choose.
4. S demanded both rows.
5. No clear data available.

22 WHY?
Same as test 14.

23 FIELD DEPENDENCE [3] (WISC)
This is the picture completion test in the Wechsler Intelligence Scale for Children. The WISC raw score is criterion of performance on this test.

24 TEST OF CORRESPONDENCE [4]
The subject is given a box of checkers and asked to make a row like the one made by the experimenter, which consists of five checkers evenly spaced.

1. S's row was equivalent.
2. S used five checkers but did not arrange them in the same array as the experimenter's.
3. S did not use five checkers and also did not use

all the checkers he was given.
4. S used all the checkers given him.

25 STANDARD TEST OF CORRESPONDENCE
The experimenter lays out two equivalent rows of five checkers. The subject is asked (1) "Do you have more checkers than I have?" (2) "Do I have more checkers than you have?" (3) "Do we have the same number of checkers?" (This is the paradigm of all following tests of correspondence and conservation.)

1. S responded: no, no, yes.
2. S responded: yes, no, yes.
3. S responded: no, yes, yes.
4. S responded: no, no, no.
5. S responded: no, yes, no.
6. S responded: yes, no, no.
7. S responded: yes, yes, no.
8. S responded: yes, yes, yes.
9. No clear data available.

26 WHY?
Same as test 14.

27 COUNTING ABILITY (Similar to test 15)
This test of counting ability is given to subjects who do not give response 1 on test 25. Scoring is the same as that for test 15.

28 MEMORY AND REPETITION
This test is also given to subjects who do not give response 1 on test 25. The subject is asked how many checkers there are in each row.

1. S responded that there are five checkers in each row.
2. S did not respond that there are five checkers in each row.
3. No clear data available.
4. Test not given.

29 CORRESPONDENCE WITH PROMPTING (Same as test 25)
This test is given to subjects who do not give response 1 on test 25. Procedure and scoring are the same as those for test 25 except for the addition of a category:

10. Test not given.

30 WHY?
Same as test 14.

31 PERCEPTUAL CORRESPONDENCE (Similar to test 25)
This test is given to subjects who do not give response 1 on test 25 or test 29. The checkers of one row are placed on top of those of the other row to emphasize their one-to-one correspondence. The rest of the testing procedure and scoring are the same as those for test 25 except for the addition of a category:

10. Test not given.

32 WHY?
Same as test 14.

33 CONSERVATION (Same as test 25)
This test is given to subjects who give response 1 on one or more of the three preceding correspondence tests (25, 29, 31). Procedure and scoring are the same as those for test 25 except for the addition of a category:
10. Test not given.

34 WHY?
Same as test 14.

35 CONSERVATION WITH DIFFERENT OBJECTS (Similar to test 25)
This test is given to subjects who give response 1 on test 33. One of the rows of five checkers is removed and replaced with a row of five cards. Further procedure and scoring are the same as those for test 25 except for the addition of a category:
10. Test not given.

36 WHY?
Same as test 14.

37 CORRESPONDENCE-CONSERVATION FINAL SCORE
This is a final summary score of subjects' performance on the preceding tests of correspondence and conservation (tests 25-36).
1. S failed to give response(1) on all correspondence test (25, 29, 31, 33). ←
2. S shows only perceptual correspondence (31) but without reason (32).
3. S shows perceptual correspondence with reason.
4. S shows correspondence with prompting (29) but no counting (27) or reason (30).
5. S shows correspondence with prompting, counting, and reason.
6. S shows correspondence (25) but without reason (26).
7. S shows correspondence with reason.
8. S shows conservation with similar objects (33) but without reason (34).
9. S shows conservation with similar objects with reason.
10. S shows conservation with dissimilar objects (35) but without reason (36).
11. S shows conservation with dissimilar objects with reason.

38,39 ROLE-TAKING TEST: LABELING
The subject is asked to identify and label colored cut-out figures (test 38):
1. Mommy/daddy, mother/father.
2. Man/lady or woman.
3. Boy/girl.
4. Man/could not identify the mother figure.
5. Boy/could not identify the mother figure.

6. Could not identify the father figure/lady or woman.
7. Could not identify the father figure/girl.
8. S labeled figures with proper names.
9. S used labels other than those above.

Response labels for same-sex-as-subject sibling and baby figures (test 39):

1. Boy (girl)/baby.
2. S called both boy (girl).
3. S called both baby.
4. S labeled both figures with proper names.
5. S used labels other than those above (such as sister/brother).

40 USE OF FIGURES IN RETELLING A STORY [5]

The subject is told a story which includes "Mommy, Daddy, Brother or Sister, and Baby" as characters:

Mommy, Daddy, Brother (Sister), and Baby have come into the kitchen for breakfast. Mommy serves breakfast. Baby starts to cry because his cereal is too hot. Mommy goes over to Baby and says, "there, there, don't cry." Brother (Sister) says, "I don't cry because I'm a big boy (girl)." Daddy says, "that's right. You don't cry because you're a big boy (girl)."

The subject is asked to retell the story. Cutout figures of Mommy, Daddy, Brother or Sister, and Baby are given him to use to illustrate the story if he wishes.

1. S used figures appropriately.
2. S used figures inappropriately.
3. S did not use figures.
4. No clear data available.

41 USE OF PRONOUNS IN RETELLING [6]

It is noted how the subject relates the story - the method he employs.

1. S retold the story by acting it out - playing each of the characters.
2. S incorporated some acting into a third person narrative of the story.
3. S attempted to narrate and act out the story but was unable to recreate it coherently.
4. S narrated the story in the third person.
5. No clear data available.

42 SCORE FOR RETELLING

1. S could not relate a coherent plot.
2. S's retelling was irrelevant and egocentric.
3. S attempted to tell the story correctly but had great difficulty in maintaining a coherent plot.
4. S told the story correctly but only described the action of the plot without indicating the feelings and motivations of the characters.
5. S told the story correctly and gave some indication of the characters' feelings.
6. S told the story correctly, described the feel-

ings of the characters, and included interpretations of the motivation behind characters' actions.

43 SCORE FOR ROLE-PLAY

The subject is asked to play the part of the parent and the sibling who are the same sex as the subject. Scoring follows the paradigm of test 42.

44 DROPPING BEADS INTO A GLASS

The subject is asked to put one bead in each of two equivalent glasses simultaneously until there are 14 beads in each glass.

1. S.completed the task correctly without prompting.
2. S required prompting to complete the task.
3. S could not perform the task.
4. No clear data available.

45 CORRESPONDENCE BEADS IN GLASSES

When 14 beads have been placed in each glass by dropping them one at a time into each glass simultaneously, this test of correspondence is given. The procedure and scoring are the same as those for test 25.

46 WHY?

S-ame as test 14.

47 PROMPTING

If the subject fails to give response 1 on test 45, the experimenter empties the glasses and drops one bead in each glass simultaneously. The subject is asked if "both glasses have the same number of beads." Then the experimenter drops another bead into each glass simultaneously and repeats the question. This procedure is continued until there are 14 beads in each glass.

1. S responded to every question, that both glasses did have the same number of beads.
2. S missed a few such responses and required prompting.
3. S missed most such responses and required much prompting.
4. S did not respond consistently.
5. S always agreed, even if the experimenter had not yet dropped both beads into the glasses.
6. No clear data available.
7. Test not given.

48 CORRESPONDENCE WITH PROMPTING (Same as test 45)

This test is given again to subjects who do not give response 1 on test 45. Scoring is the same as that for test 45 except for the addition of a category:

10. Test not given.

49 WHY?

Same as test 14.

50 CONSERVATION

This test is given to subjects who pass either of the previous correspondence tests (45, 48). The experimenter pours the contents of one of the equivalent glasses which each contain 14 beads, into a thinner glass so that the level of the beads rises. Further procedure and scoring are the same as those for test 45 except for the addition of a response category:

10. Test not given.

51 WHY?

Same as test 14

52 CORRESPONDENCE-CONSERVATION FINAL SCORE

This is a final summary score of subjects' performance on the preceding tests of correspondence and conservation (44-51).

1. S failed to give response 1 on both correspondence test (45, 48).
2. S showed correspondence only after prompting (48).
3. S showed correspondence without prompting (45).
4. S showed conservation but gave no logical reason (50, 51).
5. S showed conservation and gave a logical reason.

53 COLOR IDENTIFICATION

The subject is shown a large wooden block with one side colored red and the opposite side colored blue. He is asked to identify the colors.

1. S correctly identified the colors.
2. S gave incorrect but consistent color identification.
3. S gave incorrect and inconsistent color identification.
4. No clear data available.

54 PERSPECTIVE-TAKING

A doll is placed in front of the subject facing the subject. Then the block with opposite sides colored red and blue is placed between the subject and the doll so that one colored side faces the subject and the other faces the doll. The subject is asked,"What color does the doll see?"

1. S responded correctly without looking.
2. S responded correctly but looked around the block first.
3. S responded incorrectly.
4. S identified the doll's clothes instead of responding to the question.
5. No clear data available.

Footnotes for Appendix 1

1. This test of conservation differs from standard tests in that the correspondence between two perceptually equivalent arrays is not first established.

2. It was thought that this test would depend less on a subject's verbal ability and provide greater motivation than other conservation tests.

3. Both field independence and conservation are thought to relate to a larger process of decentering.

4. There is little existing data on childrens' ability to construct a one-to-one correspondence.

5. There is no existing data on the significance of using or not using figures in retelling a story. Not using the figures may indicate that the child cannot conceptualize the story or, on the other hand, it may mean that he conceptualizes it to a point which enables him to retell it in a more abstract manner.

6. These tests (41, 42, 43) are a modification of the work of Feffer and Gourevitch (1960) and are used to measure egocentrism in social interaction. They are predicated on the assumption that the ability to portray and characterize people other than oneself indicates social decentering.

TRAINING PROCEDURES

Sequence of Training:

Six half-hour sessions per condition group with

Two 15-minute activities per session.

Training Group	Schools	Conditions	Sessions & Activities 1	2	3	4	5	6
1	Parkside Treasure House	reversibility-reciprocity	Intro&A	AB	BC	CD	DE	EA
2	Melissa Bess St. Margaret's	role-playing	Intro&K	KL	LM	MN	NO	OK
3	Melissa Bess Treasure House	perspective-taking	Intro&F	FG	GH	HI	IJ	JF
4	Melissa Bess Wee Haven	reversibility-reciprocity & role-playing	Intro&A	AK	KC	CL	LE	EA
5	Parkside Little Red School.	reversibility-reciprocity & perspective-taking	Intro&A	GC	CH	HE	EJ	JG
6	St. Margaret's Kiddie Kastle	role-playing & perspective-taking	Intro&K	KG	GL	LH	HN	NK
7	Little Red School. Kiddie Kastle	all three conditions	Intro&A	EG	GK	KH	HL	LE
8	Wee Haven	control group	No Training					

ACTIVITIES

Reversibility-Reciprocity Training

A. Animal name cards (Discontinuous quantity)

Children sit with E around a table.
Each has own animal name card: horse, pig, cow, dog, cat, mouse, bird, fish, frog, turtle, duck, etc.
E urges children to remember which animal is theirs (how many can read own name?).
All name cards are put on table in a pile. (or in a row).
E asks, "Are their enough animals for all of us now?" Gets answers from various children. Then "Let's see..."
E picks up cards one by one, names the names on cards, children claim them. "Yes, there are enough for all of us." When all cards passed out, repeat procedure.

B. Musical chairs and instruments (Discontinuous quantity)

Divide group into two parts, E filling in if necessary to make groups equal.
Group 1 has chairs, placed back to back in two rows, a chair for each child.
Group 2 has instruments (oatmeal boxes, coffee cans, any percussive object).
E says, "Let's trade chairs for drums. Are there enough chairs for the drummers?" Drummers answer. "are there enough drums for the chair-sitters?" Chairs answer. "Let's find out." Directs each child in one group to trade with one in the other group.
More circling, playing.
E asks same questions of the groups. Trade again.

B. Alternate

Liquids poured into different glass containers (Volume).
Begin with a jar filled with liquid.
Mark the level with a rubber band.
Pour into a taller, thinner container. E asks "Is there still as much water now?"
"Let's see." Pour back. "Yes, it goes right back up to the mark!
Pour into a low glass dish or other emphatically horizontal container.
Same question. Pour back.
Have each child perform the activities himself, answering the questions.

C. Dolls and Carriages (Discontinuous quantity)

Begin with six dolls in six carriages in row on table.
Ask a child to take all dolls out and place in pile opposite row of carriages.
E asks, "Are there enough carriages for dolls?" "Let's see."
Have a child put all the dolls back in.
Then take dolls out, place them in a row longer than the row of carriages. Same question, have a child replace dolls.

Give half of group dolls, half carriages.
Place two groups of children in opposing rows, the carriage group spread farther apart.
"Do you think there are enough buggies over there so your doll has one?" Ask each child in doll group.
"Let's see." Have one child from carriage group come over to each in doll group. Dolls are put in carriages.
"So - did all the dolls get carriages?"
Can be repeated in more rows, circles of children.

D. Rings containing blocks (Discontinuous quantity)
There are two large flat rings of cardboard on table.
E places 1 block in one ring, 2 in the other, asks how many are there in each ring. Point to each thru song.
Sing, chant: "One is one and two is two, let's see how they stay that way, no matter what you do." Move blocks within each ring, spreading them out or whatever.
Add a block to each ring. "How many?"
Sing: "Two is two, three is three, you can't change that, don't you see." (distort block arrangement).
Add again: "How many?"
Sing: "Three is three, four is four, we can spread them out, but there just aren't any more." (spread)
Add again: "How many?"
Sing: "Four is four and five is five, we can move them inside but they're still four and five! (move)
Whole song can be repeated, with a different child adding the blocks and disarranging them at each stanza.

E. Balls of play-dough and balance-scale (Weight)
Begin with two balls of dough.
Ask "Do they look the same?" Change til all agree.
"Let's see if they weigh as much as each other."
Show how same on the scale.
Change the shape of one ball to oblong.
"Now do they look alike?" No. "Do they still weigh as much as each other?"
"Let's see." Weigh, demonstrate similarity.
Each child can repeat the activity himself, answering questions.

Perspective-Taking Training

F. The picture museum
On each side of room a large pad of newsprint is propped, facing center.
The children sit in a group on the floor between the two easels.
E makes a quick drawing on each - something the children suggest.
All children align selves (and chairs?) to face one easel.
E chooses a child to get up, stand facing the group and the other easel.
E asks the grouped children, "What's in the picture that

_____is looking at? Nobody can peek, because _____ will tell us if we are right."
Can repeat, switching directions, drawing new pictures, designating different children.

G. Circle around color--dots box
A large box is placed in center of floor: on two opposite sides are one big black dot, and two dots, (on white field) respectively; on the other two opposite sides the plain colors black and green. Children are shown all sides.
A child sits facing each side, close to box.
"Extras" stand behind each sitting child.
Each child sitting is asked what he sees on his own side.
E then asks each sitting child what the opposite child sees. His "extra" standing goes around to check, says if he is right.
Children can then switch standing-sitting positions, replay.

H. Sideways-upside down "Charlie"
One child is chosen to be "Charlie" and puts his head between his legs to look at rest of group behind him.
Group has two pictures of a tree (identical).
E says. "Here's our picture of the tree. Here's Charlie's. ← How do we put his picture so it looks right for him?" Ask one of group to put it right. Ask Charlie if it's right.
Choose another "Charlie." He lies down on his side.
Two identical pictures (large) of a chair or two real chairs. Again: Choose a child to put Charlie's so it looks right for him. Check with "Charlie" to see if right.
Can be repeated with different Charlies and picture-fixers.

I. Picture-taking the face box
A large box is placed in center of floor. Each side has a different simple face on it.
One child is chosen as the picture-taker. He stands on side opposite rest of group, holding cardboard "camera."
Each child in the group has a "book" of four pages, each with a face corresponding to those on the box.
The picture-taker "shoots."
E asks group to hold up the picture that he took.
Re-play with different children as camera, different positions.

J. The Blind Man's Trip to the Candy Store.
Two chairs are placed 15 ft. apart. In the center is a ring 3 ft. wide of flat blocks.
One child is blindfolded.
Another child, his helper, seated in one of the chairs, must tell him how to go to the other chair, the Store, without falling into the "swimming pool" in the middle.
Both children get M & Ms at end.
E should demonstrate first with a blindfolded child.

Then all participate, by twos.

Role-Playing Training

K. Costumes and parts

There are two sets of simple costumes and an action that goes with each costume: the hat stubs his toe and falls down, the glove claps his hands, the coat shivers and says "Brrr," the Indian headdress makes war whoop sounds, the scarf moves forward hopping up and down, etc.

E gives each set of two identical costumes to two children, demonstrates the action, has them imitate it. "Now remember what the hat does, etc."

Children all stand at one side of room.

E announces, "When I call out your special outfit, come out and do your special part, and then come over to this other side of the room, Let's see if everybody remembers and gets over to this side." Calls out "hats," "coats," in any order, helping children to remember their actions.

When all have arrived across room, E says, "This time I'm just going to do your part. When you see your special part, come out and do it too. Then go to the other side. Let's see if everybody gets to the other side this time."

If too difficult, game could be played simply passing a costume around, each child donning it and performing the act or set of acts that go with it.

L. Johnny's new slinky.

E tells story: "I know a story about two little children. Listen carefully because then two of you are going to play the story. One day Johnny's Mommy went to the store and bought him a new slinky just like this. (show) Johnny was so happy (smile, bounce), Johnny's friend Billy (Susie) came over to play. Johnny said, "See my new slinky?" Billy said, "Oh, I like your new slinky. Can I play with it?" Johnny said, "No. You can't. It's my slinky." Billy said, "Oh, please can't I play with it?" And Johnny said, "NO. It's mine!" So poor Billy started to cry. What did Johnny do then? Let's play the story and see."

E designates two children as actors, plays Mommy and gives slinky to "Johnny." Prompts children along - "What does Billy do now?" etc.

Continue with new children, change story to fit sex roles, etc.

M. Casper the Friendly Ghost

Set of paper-plate masks. Two of each expression: smiling, frowning, scared, sleepy.

E: "Look at these masks. Everybody is going to have one to wear. When I wear the Happy mask, I'm happy and I laugh, ho, ho. When I wear the Unhappy mask, I cry. (Demonstrate each time.) When I wear the scared mask, I run away to that window. When I wear the sleepy mask, I go ho hum and lie down to sleep."

E gives mask to each child, puts it on.

Rehearse, asking each two masks what they do.
E: "Now let's play a story. One day all the people were in their house together. All of a sudden, along came Casper the Ghost! 'I'm the ghost. Here I come. What do all the masks do?" Play it several times, encouraging children to react, improvise according to their masks.

N. Breakfast Story

E tells: "One morning Mommy and Grandma (Grandpa) and the little boy were sitting at the breakfast table. Mommy poured some coffee for Grandma. Oops. She spilled some hot coffee on the little boy. Just a little drop. Ouch! Ouch! The little boy started to cry. Mommy said, 'Oh, dear, I'm so sorry. Here. Let's fix your burn. Here's a bandage.' Then the little boy felt better. Grandma cleaned up the spilled coffee with a sponge."

Get children to play three role - with some props: cups, coffee pot, bandage, sponge. Rotate active roles while whole group sitting at "breakfast table."

O. Reading aloud "The Little Red Hen" (shortened version)

Assign animal roles to various children. Their job is to chime in on cue with the "Not I, said the duck, quack, quack, etc."

Have other children act out each of little red hen's steps as story progresses.

SAMPLE

Log Cover Sheet

DATE_____ TEACHER_____

SCHOOL_____ GROUP (by code or condition)

SESSION NO._____ TIME_____to_____

Children absent:

Activities planned: Carried out (check)

1. _____

2. _____

Brief summary of session:
(Major events, problems, issues needing immediate attention)

Equipment and Materials

Large quantity 18" X 11" colored construction paper (name tags, block sides, photo books, etc.) Variety of colors
Elmer's glue-big bottles
Large safety pins for name tags
5 - lb. oatmeal boxes, coffee cans
10 large sheets poster board
5 glass jars, 5 tall glasses, 5 glass plates or low bowls
Dolls and carriages
10 lbs. play-dough
Balance scale
10 flat wood blocks - small
2 pads of newsprint - 18" X 11" or larger
Crayons
2 large cardboard cartons - 2 ft. high
Small cardboard box made into "camera"
String - for lacing "photo books," holding masks on
Scarf, some kind of blinder
M & M candy
hat, glove, coat, Indian headdress
Slinky or other sexless toy
Paper plates - 25
Toy cups, coffee pot, sponge, bandaid
Copy of Little Red Hen for reference

Supply of Log Cover Sheets
Clipboards or note pads
Tranquilizers (for E ???????)
Copy of "Ethical Standards for Psychologists"
Purple Heart

POOR ORIGINAL COPY - BEST
AVAILABLE AT TIME FILMED